REMARKS/ARGUMENTS

In the Office Action, claims 1-30 were rejected. Claims 1, 15, and 23 have been amended, and claims 7, 16-22, and 29-30 have been cancelled without prejudice. Claims 1-6, 8-15, and 23-28 remain under consideration in this application. Applicant respectfully requests reconsideration for the reasons discussed below.

Objection to Specification

Applicant has noted the examiner's objection to the abstract. The abstract has been amended by the present response to obviate the basis for the objection. Reconsideration and approval is requested.

35 USC 102(b) rejections

Applicant has canceled claims 29-30.

35 USC 103(a) Rejections

The Examiner rejected claims 1-14 and 23-27 under 35 USC 103(a) as being unpatentable over Makio et al (US6047010) in view of Cox et al (US20030086466) and Matsumoto et al (US 6295305). The Examiner further rejected claims 15 and 28 under 35 USC 103(a) as being unpatentable over Makio in view of Cox, Matsumoto, and Saikawa et al. (J. Saikawa et al "Volume Holographic Memories By Using Tunable Frequency doubled ND-YAG Microchip laser", 1999WEE PP 1179-1180.) Lastly, the Examiner rejected claims 16-22 under 35 USC 103(a) over Makio in view of Cox. Applicant has canceled claims 16-22 and amended claims 1 and 23.

Applicant respectfully submits that the applied references do not teach, suggest, or disclose the currently amended claim 1 or 23 recitations of (with emphasis added):

1. An apparatus, comprising:

a **tunable** laser cavity, wherein said laser cavity comprises at least three mirrors, at least one filter and a plurality of crystals, wherein said **at least three mirrors are substantially arranged in a lambda configuration**, said at least one filter comprises a birefringent filter and an etalon, at least one of said plurality of crystals comprises a Coloquiriite crystal, and at least one of said plurality of crystals comprises a nonlinear crystal, wherein said at least three mirrors, said at least one filter, and said plurality of crystals are configured for providing electromagnetic radiation of an approximately single frequency;

and

at least one electromagnetic radiation source being coupled to the laser cavity, wherein said at least one electromagnetic radiation source is capable of providing electromagnetic radiation having an approximately particular wavelength to said laser cavity, wherein at least one of said plurality of crystals is configured to, in operation, alter one or more properties of said electromagnetic radiation provided by said electromagnetic radiation source,

wherein said at least one filter is configured to filter at least a portion of the electromagnetic radiation altered by at least one of said plurality of crystals, wherein the at least one filter is adjustable to tune the frequency of the electromagnetic radiation altered by the at least one of said plurality of crystals.

23. A **tunable** laser system, comprising:
a laser source;
two or more crystals, wherein one crystal comprises a laser crystal, and one crystal comprises a nonlinear crystal;
at least three mirrors, substantially arranged in a lambda configuration; and
one or more filters,
said laser source, said one or more crystals, said at least three mirrors and said one or more filters being configured such that said laser source is capable of producing electromagnetic radiation within a particular wavelength range, at least one of said two or more crystals being configured to alter one or more properties of said electromagnetic radiation, **and at least one of said one or more filters being configured to filter at least a portion of the electromagnetic radiation altered by said two or more crystals, wherein the portion filtered is adjustable to tune the frequency of the electromagnetic radiation altered by said two or more crystals**.

Claim 1 has been amended to include the recitation in claim 7 that "said at least one filter is configured to filter at least a portion of the electromagnetic radiation altered by at least one of said plurality of crystals, wherein the at least one filter is adjustable." Applicant respectfully traverses the Examiner's argument that Makio et al., in col. 5 lines 1-5, teaches a filter which is adjustable (via thickness). Makio appears to be talking about design considerations when selecting the thickness of the crystal. Applicant submits that the thickness of the crystal of Makio cannot be dynamically adjusted to provide tunability.

Amended claims 1 and 23 recite a laser cavity, which is especially configured for providing electromagnetic radiation of an approximately single frequency wavelength (claim 1) or within a particular wavelength range (claim 23) along with wavelength tunability. Both the characteristics are achieved by the particular combination of cavity design and choice of cavity elements disclosed by the claims. Some of the different elements of the present invention may have been disclosed by the various references, but the combination of cavity design and the cavity elements disclosed in claims 1 and 23 is not rendered obvious by any of the references individually or in combination.

The Examiner acknowledges that Makio does not disclose all the elements and their arrangement in the laser cavity as recited in claim 1 and claim 23. Specifically Makio does not teach the Lambda configuration with the use of one or more filters, wherein at least one filter is configured to filter at least a portion of the electromagnetic radiation altered by at least one of said plurality of crystals, wherein the at least one filter is adjustable to **tune** the frequency of the electromagnetic radiation.

The examiner contends that Cox teaches the lambda configuration taught by Applicant. Cox may teach a folded configuration using three mirrors, but does not specifically teach the Lambda configuration as defined by Applicant anywhere in the specification. As defined by Applicant, a Lambda configuration is a physical configuration of mirrors comprising three or more mirrors, wherein at least two of the mirrors are arranged at approximately equal and approximately opposite angles and approximately equidistant

from at least a third mirror. Fig. 1 of Cox clearly does not show the mirrors as being approximately equidistant from at least a third mirror as alleged by the examiner.

The Cox configuration and cavity parameters are dictated by the need for the formation of a Lyott filter by a combination of the fold mirror and the birefringent material. In the present invention, a specific adjustable filter is used along with any other filters to enable generation of single frequency electromagnetic radiation or a particular wavelength range and to achieve wavelength tunability. Such a configuration is not disclosed by Cox.

Moreover Applicant questions whether there is motivation to combine Cox with Makio and Matsumoto due to the different laser cavity configuration of Cox in comparison to that of Makio and Matsumoto. Either way, no combination of the applied references teaches or suggests the tunable laser cavity recited in claims 1 and 23 of the instant specification.

In view of the above arguments, Applicant respectfully submits that claims 1 and 23 are patentable over Makio in view of Cox and Matsumoto. Claims 2-6 and 8-15 depend from claim 1, and claims 24-28 depend from claim 23 and are therefore believed to be in condition for allowance regardless of whether Saikawa might suggest use in a holographic data recording system as recited in claims 15 and 28.

Summary

Applicant submits that the remaining claims define allowable subject matter over the applied art and respectfully requests that a timely Notice of Allowance be issued in this case. Should the Examiner believe that anything further is needed to place the application in better condition for allowance, the Examiner is requested to contact Applicant's undersigned representative at the telephone number below.

Respectfully submitted,

By /Ann M. Agosti/

Ann M. Agosti
Reg. No. 37,372
General Electric Company
Building K1, Room 3A66
One Research Circle
Niskayuna, New York 12309
Telephone: (518) 387-7713